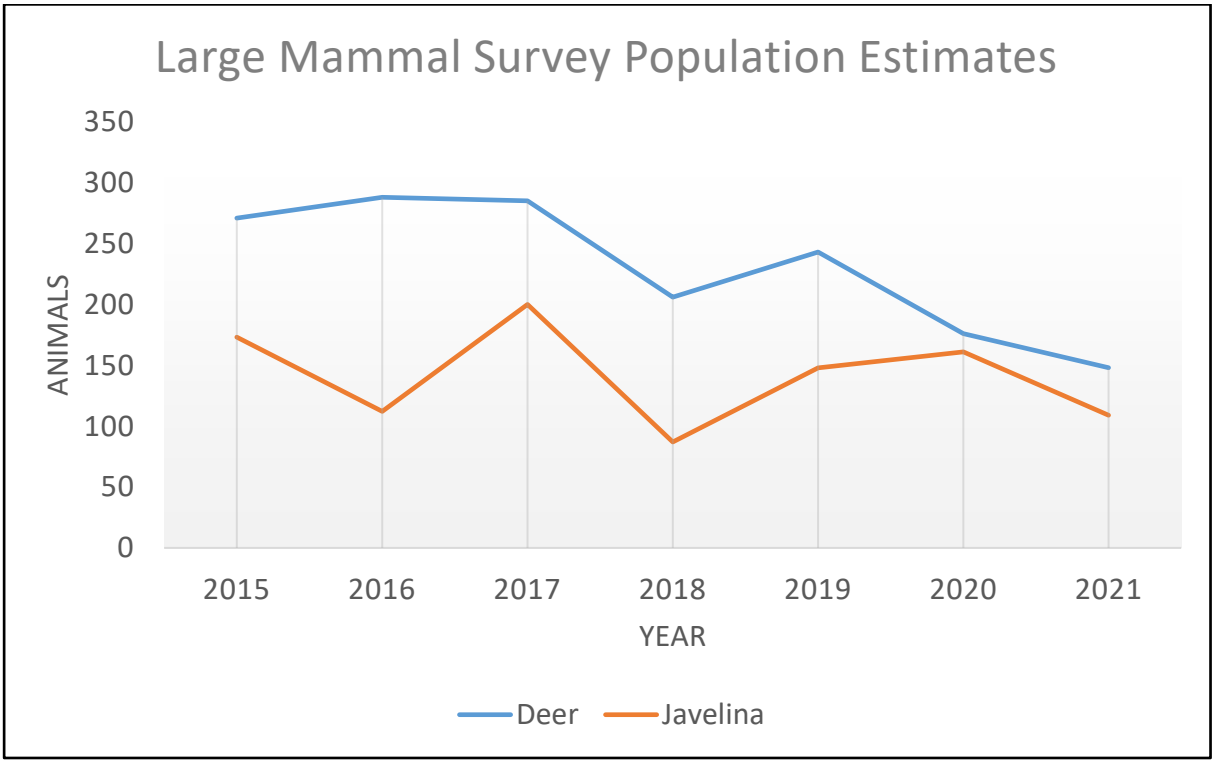
2021 Deer and Javelina Survey Results for the McDowell Sonoran Preserve

Collaborative efforts between the Arizona Game and Fish Department (Department), the City of Scottsdale (City) and the McDowell Sonoran Conservancy (MSC) resulted in aerial surveys of large mammals (deer and javelina) in the McDowell Sonoran Preserve (Preserve). In October of 2017 the Arizona Game and Fish Department and the City of Scottsdale renewed the Wildlife Study Agreement for aerial surveys for deer and javelina for an additional five years. With data from these flights, managers will be able to estimate deer and javelina populations within the Preserve for the length of the study agreement.

Low level helicopter surveys were performed on January 13th, 2021 with biologists from Arizona Game and Fish Department. Due to safety concerns related to COVID-19, staff from City of Scottsdale were not able to participate in helicopter surveys this year. Surveys totaled 4.1 hours covering approximately 209 miles of transect distributed throughout the Preserve (54 square miles). The total number of deer and javelina observed during the 2021 survey are included in the appendix at the end of this report.

POPULATION ESTIMATES:

Based on 2021 survey data the resulting population estimate for the Preserve is 148 deer and 109 javelina. The graph below shows annual population estimates for the Preserve since 2015.



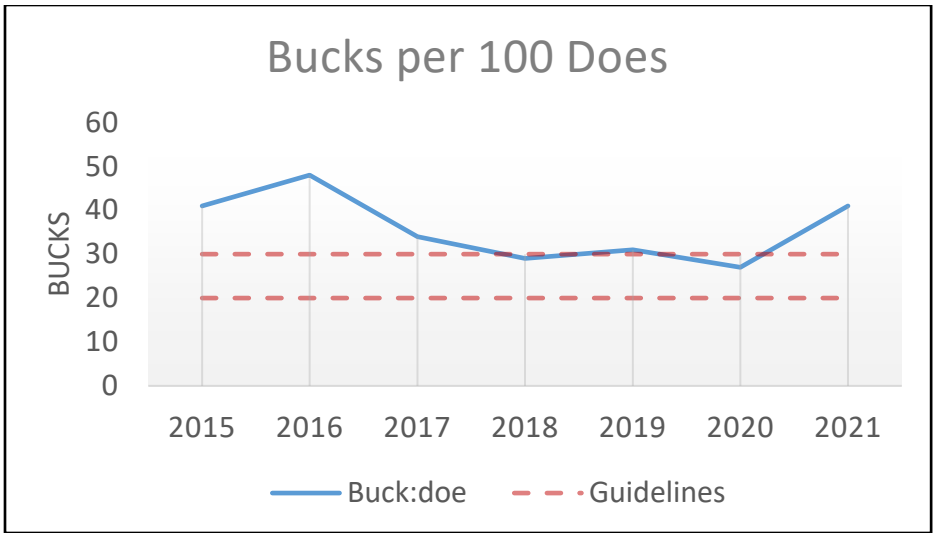
While surveys allow for the calculation of a relative abundance of wildlife, managers historically place more emphasis on evaluating ratios of males, females and juveniles within the population as well as multi-year trends in data to make assessments and inferences about the health of hunted populations.

DEER ANALYSIS

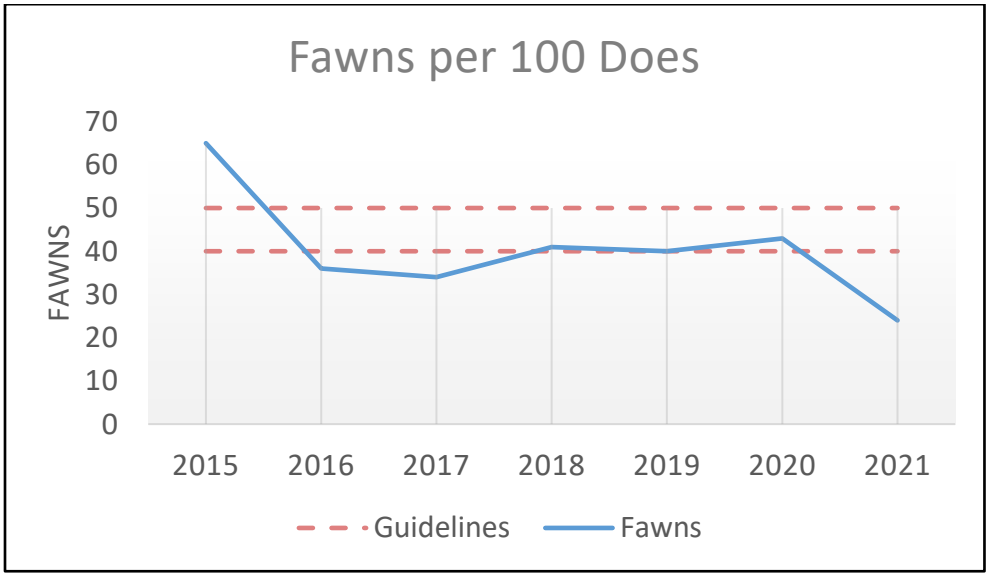
Survey data over the last several years has shown deer density for the Preserve to be higher than other units with similar habitat, and this trend has continued in 2021 with an estimated deer density of 2.8 deer/mi^2 in the preserve compared to 1.5-2.0 deer/mi^2 in similar game management units in the state. There was an increase in total number of deer physically observed from the helicopter in 2021 relative to 2020 (104 from 84, respectively), however overall population estimate decreased over this same timeframe due to calculated observation rates. The 2021 deer estimate of 148 decreased from last year's 176. These fluctuations in population estimates based on survey observations can be attributed to numerous factors including changes in personnel on the survey flights as well as weather conditions.

During survey flights it was also noted that construction and development continues to increase on the periphery of the preserve, which may also impact deer location, habitat utilization, and dispersal. Due to the relative size of the Preserve and its connection with the McDowell Mountain Regional Park and Tonto National Forest, deer populations within the Preserve may be impacted by immigration and emigration movements to utilize habitat not included in this survey. These variances from year to year are why management guidelines rely upon three to five year averages and data trends rather than solely on any one given year.

The Department's deer management goal is to maintain and, where possible, enhance deer populations at levels that provide maximum and diverse recreational opportunities, while avoiding adverse impacts to the species and its habitat. Department deer management guidelines consist of a set of management targets for several population indices. These guidelines have prescribed upper and lower bounds, which are tied directly to wildlife science and research, and they inform harvest prescriptions to maintain, increase, or decrease hunting opportunity through permits or season length. These guidelines are set with the intention to foster healthy, resilient and self-sustaining populations. When population trends occur above guidelines, this suggests that there is an increased potential for population growth and/or harvest opportunity. Conversely, population trends occurring below guidelines suggest low potential for population growth and maintenance at the current hunting opportunity, or even potentially a reduction in opportunity or season lengths. The Department places emphasis on the trend in population data over three to five years when making assessments and management decisions. The population ratios of bucks per 100 does and fawns per 100 does are used (among others), to assess deer populations by the Department. The 2021 Department deer management guidelines and Preserve survey results are shown in the graphs below.



The graph above shows the relative abundance of adult male deer to adult female deer. Values above 30:100 over multiple years would indicate male (buck) harvest could be increased without impacting the survivability of the population. There is no biological detriment to the deer herd being above guidelines. Values below 20:100 over multiple years may indicate a need for a decrease in hunting opportunity (permits or season length). The number of bucks to does is a management driven index largely dependent on the intensity of buck harvest.



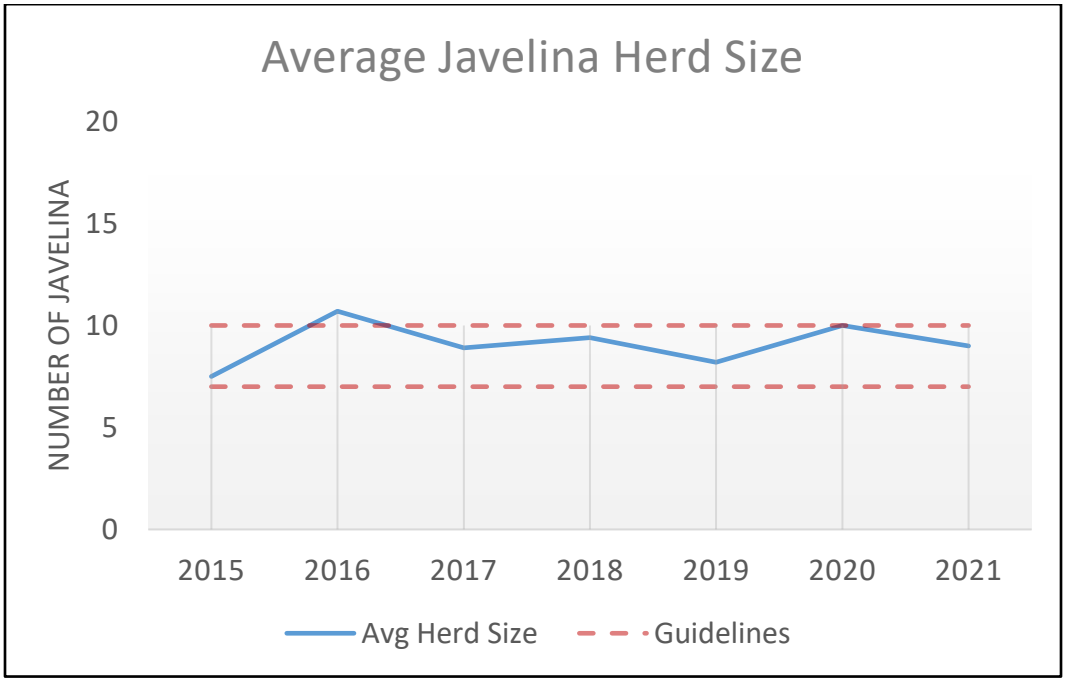
The graph above shows the relative abundance of juvenile deer (animals less than 1 year old) to adult female deer. Any value above 50:100 indicates prospective potential for population growth. Values below 40:100 over multiple years may indicate a need for a decrease in hunting opportunity (permits or season length). However, when buck to doe ratios are within or above guidelines, the fawn to does ratio is influenced to a greater degree by habitat quality and predation pressure, which have a more direct impact on increased annual natality and recruitment. A possible explanation for the decrease in the fawn to doe ratio observed this year may be tied to the lack of

precipitation in 2020 and subsequent decrease in quality in forage in the Preserve. Additionally, coyotes are known to opportunistically prey on mule deer fawns, and a total of 6 were observed on the 2021 survey flight, frequently also within a mile of does with fawns present.

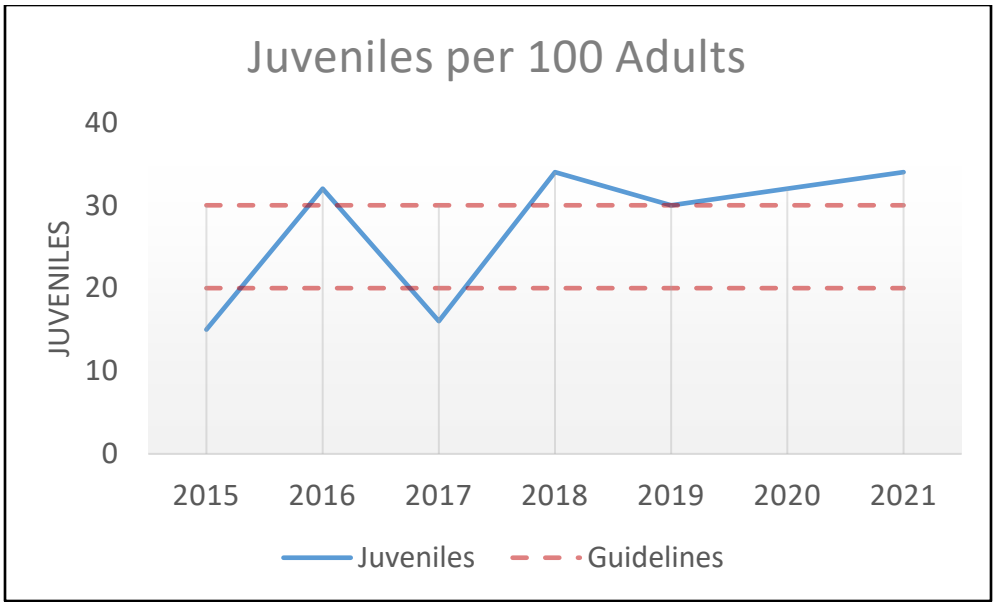
JAVELINA ANALYSIS

The 2021 javelina estimate (109) is a decrease from the 2020 survey (161), however three year trends indicate a stable population in the Preserve. Survey intensity (miles of transect length) within the Preserve would need to be increased to predict population abundance with a reliable degree of precision. This is due to the limited sample size, or number of javelina observations recorded per survey effort.

The Department's javelina management goal is to maintain javelina populations at levels that provide diverse recreational opportunities, while avoiding adverse impacts to the habitat, and minimize substantiated depredation and nuisance complaints. Javelina population indices of average herd size and number of juveniles to 100 adults are used, among others, to assess javelina populations by the Department. The 2021 Department javelina management guidelines and Preserve survey results are shown in the graphs below.



The graph above shows the average number of javelina per herd. Values above ten for multiple years would indicate harvest could be increased without impacting the survivability of the population. There is no biological detriment to the herd average being above guidelines. Values below seven javelina per herd over multiple years may indicate a need for a decrease in hunting opportunity (permits or season length).



The graph above shows the relative abundance of juvenile to adult javelina. The three year average is 32:100 which is slightly above guidelines. Any value above 30:100 indicates increased potential for population growth. Values below 20:100 over multiple years may indicate a need for a decrease in hunting opportunity (permits or season length).

As previously stated, wildlife managers place emphasis on trends in population indices to make assessments and inferences about the health, or fitness, of hunted populations. Based on average herd size and juvenile to adult ratios occurring within or slightly above guidelines, survey data in the Preserve indicates that the javelina population is stable and healthy.

HARVEST DATA

2020 harvest data is not yet available as of the drafting of this report for over the counter (OTC) deer tags in game management unit (GMU) 25M, of which the Preserve is a part. In 2019, the most recent year for which there is data, there was a 10% OTC archery success rate in GMU 25M. Approximately 58 hunters submitted voluntary hunter declarations for the Preserve during the December 2020 - January 31, 2021 deer and javelina season. If hunter declarations are utilized for an approximation for harvest data and an average statewide archery hunt success of 7% is applied, a conservative estimate of four deer were harvested in the Preserve during the 2020-21 seasons. Utilizing the 10% success rate reflected in the 2019 hunter questionnaire data, the number of deer harvested would be approximately 6. It is unknown what percentage of hunters do not voluntarily submit declarations. Declarations are submitted prior to hunters taking to the field and do not accurately represent hunter-use days.

REPORTED INCIDENTS

The Department received zero Operation Game Thief (OGT) reports of hunter trespass during the 2020/21 season. The Department issued no citation for take of wildlife in the Preserve.

During the 2016/17 archery deer and javelina season, residents in the area west of Tom's Thumb filed several complaints of people archery hunting within one-quarter mile of residences which at that time was prohibited in the Scottsdale McDowell Sonoran Preserve per Arizona Game and Fish Department Regulations. To address the neighborhood concerns, staff from the Arizona Game and Fish Department and the City of Scottsdale installed signage and produced detailed maps notifying hunters of the one-quarter mile closure. These efforts were successful in encouraging compliance with the quarter mile rule. On November 3, 2019 Commission Rule R12-4-303h made it unlawful for any person to discharge an arrow or any other archery equipment within one-quarter mile of an occupied structure anywhere in Arizona. Applying the quarter mile rule to the entire state appears to have further promoted compliance around the edges of the preserve.

Appendix
2021 Large Mammal Survey Observations

2021 MSP Aerial Survey Results			
Survey Location: Browns Ranch			
Hours Surveyed: 1.2			
Deer		Javelina	
Bucks	8		
Does	21	Juveniles	8
Fawns	10	Adults	26
Total	39	Total	34

2021 MSP Aerial Survey Results			
Survey Location: McDowell Mountains			
Hours Surveyed: 2.9			
Deer		Javelina	
Bucks	18		
Does	42	Juveniles	9
Fawns	5	Adults	24
Total	65	Total	33

2021 MSP Aerial Survey Results			
Survey Location: Preserve			
Hours Surveyed: 4.1			
Deer		Javelina	
Bucks	26		
Does	63	Juveniles	17
Fawns	15	Adults	50
Total	104	Total	67